

IN THE CLAIMS:

Claim 1 (Currently amended): Pump for low flow rates comprising

- a channel which is at least partially filled with a transport liquid (3)
- a membrane (4, 12) at one opening of the channel that can be wetted by the transport liquid,
- a gas space having an essentially constant vapour pressure of the evaporated transport liquid located at the side of the membrane opposite to the transport liquid, wherein a continuous and constant loss of vapour results in a vapour pressure below a saturation vapour pressure, thus leading to an essentially constant flow rate through the membrane.

Claim 2 (Currently amended): Pump as claimed in claim 1, in which the space contains a sorbent (6, 15) which sorbs evaporated transport fluid liquid.

Claim 3 (Original): Pump as claimed in claim 1, in which the space and the transport liquid are separated from one another by the membrane.

Claim 4 (Currently amended): Pump as claimed in claim 2, in which the sorbent is located in a the housing having an opening, wherein the opening is closed by the membrane.

Claim 5 (Previously presented): Pump as claimed in claim 4, in which the sorbent has no direct contact with the membrane.

Claim 6 (Original): Pump as claimed in claim 1, in which the space is formed by a housing (7) which exchanges evaporated transport liquid with the outer space.

Claim 7 (Original): Pump as claimed in claim 1, in which the membrane is hydrophilic.

Claim 8 (Currently amended) ~~Pump as claimed in claim 2, in which~~ Pump for low flow rates comprising

- a channel which is at least partially filled with a transport liquid (3)
- a membrane (4, 12) at one opening of the channel that can be wetted by the transport liquid, and
- a space having an essentially constant vapour pressure of the transport liquid located at the side of the membrane opposite to the transport liquid, in which the space contains a sorbent (6, 15) which sorbs evaporated transport liquid, wherein

the membrane has a hydrophilic region facing the transport liquid and a hydrophobic region which faces the sorbent.

Claim 9 (Original): Pump as claimed in claim 8, in which the sorbent is in contact with the hydrophobic region of the membrane.

Claim 10 (Currently amended): ~~Pump as claimed in claim 1, which has~~ Pump for low flow rates comprising

- a channel which is at least partially filled with a transport liquid (3)
- a membrane (4, 12) at one opening of the channel that can be wetted by the transport liquid,
- a space having an essentially constant vapour pressure of the transport liquid located at the side of the membrane opposite to the transport liquid, and

at least one non-wettable membrane (5) which is located on a side of the wettable membrane facing away from the transport liquid.

Claim 11 (Currently amended): ~~Pump as claimed in claim 1, in which~~ Pump for low flow rates comprising

- a channel which is at least partially filled with a transport liquid (3)
- a membrane (4, 12) at one opening of the channel that can be wetted by the transport liquid,

- a space having an essentially constant vapour pressure of the transport liquid located at the side of the membrane opposite to the transport liquid, wherein

the channel contains a working liquid that is segmented from the transport liquid.

Claim 12 (Currently amended): ~~Pump as claimed in claim 1, in which Pump for~~
low flow rates comprising

- a channel which is at least partially filled with a transport liquid (3)

- a membrane (4, 12) at one opening of the channel that can be wetted by the transport liquid,

- a space having an essentially constant vapour pressure of the transport liquid located at the side of the membrane opposite to the transport liquid, wherein
the membrane is formed by an array of capillary channels.

Claim 13 (Original): Pump as claimed in claim 12, in which the capillary channels are located in a body in which the channel conveying the transport liquid is also located.

Claim 14 (Previously presented): Pump as claimed in claim 12, in which the capillary channels are manufactured by microtechnology using etching processes, laser machining, or by stamping, injection moulding or moulding processes.

Claim 15 (Previously presented): Pump as claimed in claim 12, in which the array comprises 3 to 100 capillary channels.

Claim 16 (Original): Pump as claimed in claim 12, in which the capillary channels of the array have a diameter of the individual channels in the range of 10 nm to 100 μm .

Claim 17 (Currently amended): Microdialysis system comprising

~~a pump as claimed in claim 1~~ having

- a channel which is at least partially filled with a transport liquid (3)

- a membrane (4, 12) at one opening of the channel that can be wetted by the transport liquid,

- a space having an essentially constant vapour pressure of the transport liquid located at the side of the membrane opposite to the transport liquid, and

a microdialysis membrane, wherein [past which] the transport liquid or a working liquid is transported through the microdialysis membrane by the pump.

Claim 18 (Original): Microdialysis system as claimed in claim 17 containing a sensor located downstream of the microdialysis membrane for the detection of one or several analytes in the transport or working liquid.

Claim 19 (Currently amended): Ultrafiltration device comprising a pump as claimed in claim 1 and an ultrafiltration membrane through which ~~the~~ a body fluid is drawn into the channel.

Claim 20 (Currently amended): Ultrafiltration device ~~as claimed in claim 19~~ containing comprising

a pump having

- a channel which is at least partially filled with a transport liquid (3)

- a membrane (4, 12) at one opening of the channel that can be wetted by the transport liquid,

- a space having an essentially constant vapour pressure of the transport liquid located at the side of the membrane opposite to the transport liquid,

an ultrafiltration membrane through which a body fluid is drawn into the channel, and

a sensor located downstream of the ultrafiltration membrane for the detection of one or several analytes in the body fluid.

Claim 21 (Currently amended): System for pumping a working liquid at a low flow rate, wherein at least one dilution reservoir (22) containing a liquid which is essentially free of substances that cannot evaporate at the membrane is located between ~~the~~ a fluid system in which the working liquid is located and a pump ~~as claimed in claim 1~~ including

- a channel which is at least partially filled with a transport liquid (3)

- a membrane (4, 12) at one opening of the channel that can be wetted by the transport liquid,

- a space having an essentially constant vapour pressure of the transport liquid located at the side of the membrane opposite to the transport liquid.

Claim 22 (Original): System as claimed in claim 21, in which two or more reservoirs that are connected to one another (22¹, 22², 22³, 22⁴, 22⁵, 22⁶, 22⁷, 22⁸) which form a dilution cascade are arranged between the fluid system containing the working liquid and the pump.

Claim 23 (Previously presented): Pump as claimed in claim 3, in which the space contains a sorbent and in which the sorbent is located in a housing having an opening, wherein the opening is closed by the membrane.

Claim 24 (Previously presented): Pump as claimed in claim 23, in which the sorbent has no direct contact with the membrane.

Claim 25 (Previously presented): Pump as claimed in claim 13, in which the capillary channels are manufactured by microtechnology using etching

processes, laser machining, or by stamping, injection moulding or moulding processes.

Claim 26 (Currently amended): A pump comprising:

a housing defining a gas space and including a channel, the channel being at least partially filled with a transport liquid, and

a membrane positioned in the housing, the membrane including a first side facing toward the liquid and a second side facing the gas space, wherein the gas space has an essentially constant vapour pressure of the evaporated transport liquid, wherein a continuous and constant loss of vapour results in a vapour pressure below a saturation vapour pressure, thus leading to an essentially constant flow rate through the membrane.

Claim 27 (Previously presented): The pump of claim 26 further comprising a sorbent positioned in the space.

Claim 28 (Previously presented): The pump of claim 27 wherein the sorbent is spaced apart from the membrane.

Claim 29 (Previously presented): The pump of claim 27 wherein the membrane separates the transport liquid and the space from one another.

Claim 30 (Previously presented): The pump of claim 26 wherein the membrane separates the transport liquid and the space from one another.

Claim 31 (Previously presented): The pump of claim 26 wherein the housing comprises a means for exchanging evaporated transport liquid with a space outside the housing.

Claim 32 (Previously presented): The pump of claim 26 wherein the membrane is hydrophilic.

Claim 33 (Currently amend d): ~~The pump of claim 26~~ A pump comprising:

a housing defining a space and including a channel, the channel being at least partially filled with a transport liquid, and

a membrane positioned in the housing, the membrane including a first side facing toward the liquid and a second side facing the space, wherein the space has an essentially constant vapour pressure of the transport liquid, wherein the membrane has a hydrophilic region facing the transport liquid and a hydrophobic region facing the space.

Claim 34 (Currently amended): ~~The pump of claim 26 further comprising A~~
pump comprising:

a housing defining a space and including a channel, the channel being at least partially filled with a transport liquid, and

a membrane positioned in the housing, the membrane including a first side facing toward the liquid and a second side facing the space, wherein the space has an essentially constant vapour pressure of the transport liquid, and

at least one non-wettable membrane positioned in the space.

Claim 35 (Currently amended): ~~The pump of claim 26 further comprising A~~
pump comprising:

a housing defining a space and including a channel, the channel being at least partially filled with a transport liquid, and

a membrane positioned in the housing, the membrane including a first side facing toward the liquid and a second side facing the space, wherein the space has an essentially constant vapour pressure of the transport liquid, and

a working liquid positioned in the channel that is segmented from the transport liquid.

Claim 36 (Currently amended): ~~The pump of claim 26 wherein~~ A pump comprising:

a housing defining a space and including a channel, the channel being at least partially filled with a transport liquid, and

a membrane positioned in the housing, the membrane including a first side facing toward the liquid and a second side facing the space, wherein the space has an essentially constant vapour pressure of the transport liquid, the membrane is formed to include capillary channels.

Claim 37 (Previously presented): The pump of claim 36 wherein the membrane includes 3 to 100 capillary channels.

Claim 38 (Previously presented): The pump of claim 37 wherein the membrane includes 5 to 25 capillary channels.

Claim 39 (Previously presented): The pump of claim 36 wherein the capillary channels each have a diameter of 10 nm to 100 μ m.

Claim 40 (Previously presented): The pump of claim 36 wherein the housing includes a base plate and a cover and the channel is formed in the base plate.

Claim 41 (Previously presented): The pump of claim 40 wherein the membrane is disposed between the base plate and the cover.

Claim 42 (Previously presented): The pump of claim 40 wherein the space is formed in the cover.

Claim 43 (Previously presented): The pump of claim 36 wherein the housing is formed to include openings in communication with the space.

Claims 44-48 (Cancelled).